Early lessons from the use of the New Zealand Science Learning Hub website

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Te Whare Wānanga o Waikato

Outline of this presentation

- The website
- Research questions
- Some insights from the pilot study with four classes
- Implications for further research on learning with ICT

The Science Learning Hub website

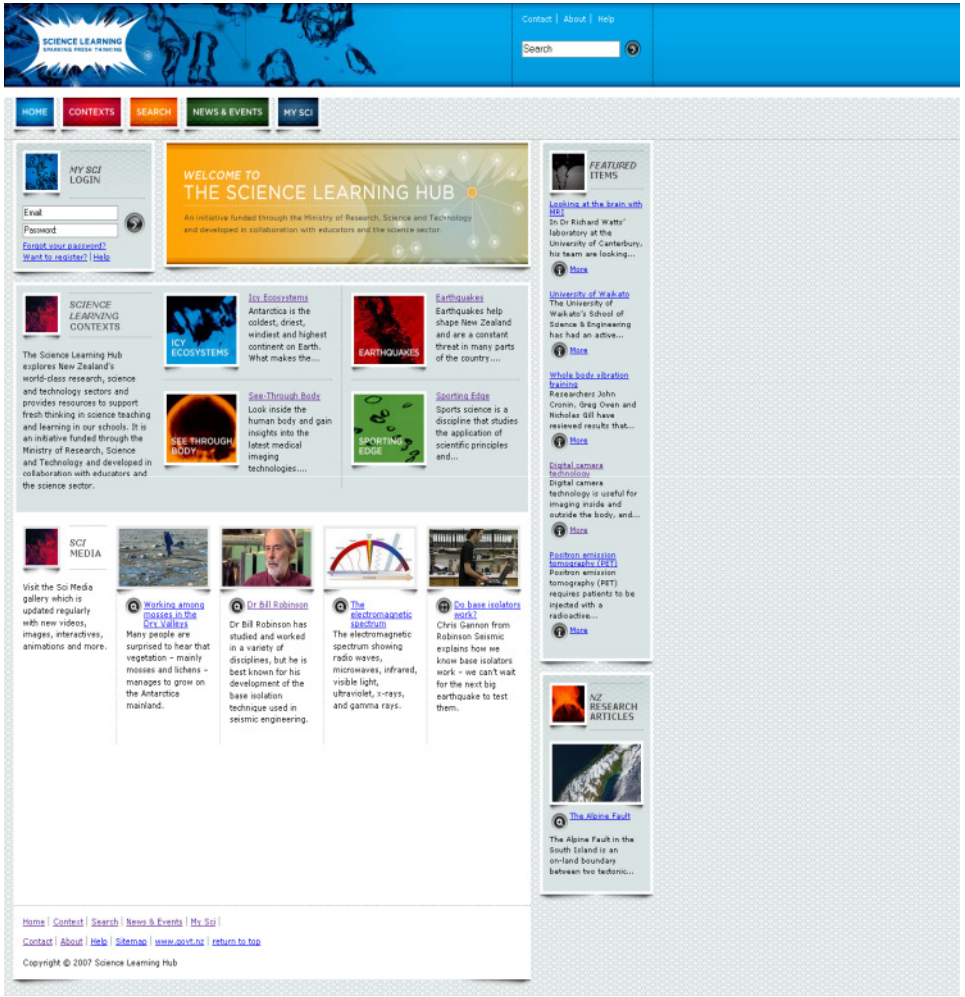
- Contextual stories which are further underpinned through
  - Ideas and concepts
  - Question bank
  - Research stories and people
  - Evidence
  - Timeline
  - Teaching and learning ideas
  - Glossary
  - Scimedia

Development of the website *www.sciencelearn.org.nz*

- Funded through Ministry of Research in Science and Technology (MoRST) and managed by the University of Waikato
- Science education researchers from three New Zealand University (Auckland, Waikato and Canterbury)
- Royal Society of New Zealand
- Scientists from New Zealand Crown Research Institutes (CRIs) and Universities
- New Zealand teachers
- Web-design team

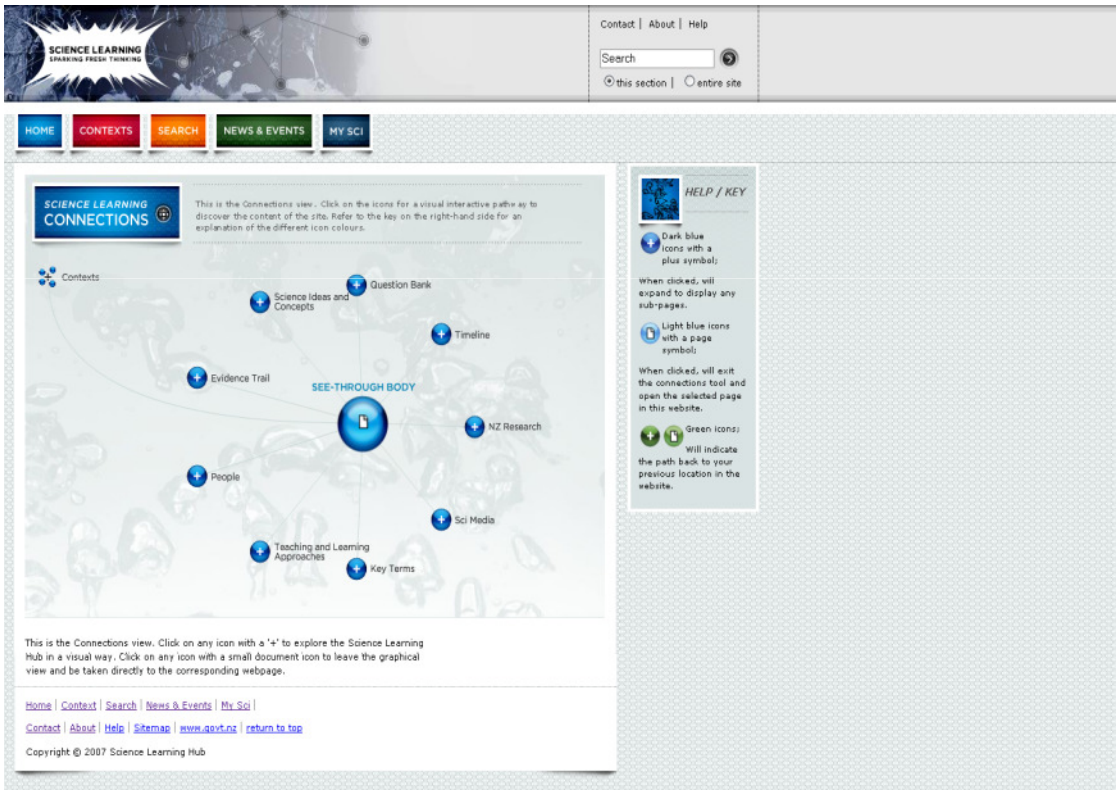
The website format

- Text
- Images
- Videos
- Animations



Navigational tools

- Internal search
- Related content
- Back button
- Connections



This pilot project

- *How do year 9 and 10 students and their teachers use the online teaching resource, the New Zealand Science Learning Hub [SLH]?*
- *What are the affordances of the SLH?*

Conducted during term 4, 2007

4 teachers from 3 North Island Colleges

108 students

Two year 9 classes (co-ed and single sex)

Two year 10 classes (both co-ed)

Methodological orientation

- Interpretivist methodology (Berg, 2004; Erickson, 1998)

- Affordances of ICT in science learning (Webb, 2005).
  - Affordances for students,
  - Elements that provide affordance,
  - Elements that increase the degree of affordance,
  - Elements that provide information about the affordance.

Data collected from

- Individual pre-interviews and focus group discussion with the teachers
- Analysis of process videos (using *Studiocode*)
- Individual interviews with students
- Analysis of student-generated work, and teacher planning

Setting the Scene

- Teachers were asked to use the SLH resource with their classes
- As part of the pre-interview the teachers were introduced to the website
  - content, structural features, navigational tools
- The teachers were able to choose website contexts and content

Teachers planned use of SLH

- All teachers began with a teacher-led introduction of the site
- Teachers provided task sheets for students to complete
- Students could explore the entire SLH
    - asked to begin lessons exploring the Hub, later included other websites
- 3 teachers planned to use the SLH for 4/5 lessons
- 1 teacher planned to use the SLH for 2 lessons

School	Context	Year	Location	Students	Lessons
Co -ed	Icy Ecosystem	9	Library PC	27	5
Co -ed	Earthquakes	10	ICT suite PC	30	4
Co -ed	Earthquakes	10	ICT suite Apple	28	4
Single sex	See-through Body	9	ICT suite PC	23	2

Process videos

To identify practice when using internet resources in the classroom (Ruthven, Hennessy & Deaney, 2005)

- Reading
- Search (Back button, boolean search terms)
- Media (images, videos, diagrams, animations)
- Problems
- Other websites
- Word processing

Video analysis

- Research question guides coding scheme
  - operational organisation
- Abstract coding categories can help to support descriptive analysis
  - change of reading, search, word processing instances over time
- Contextual examples support coding

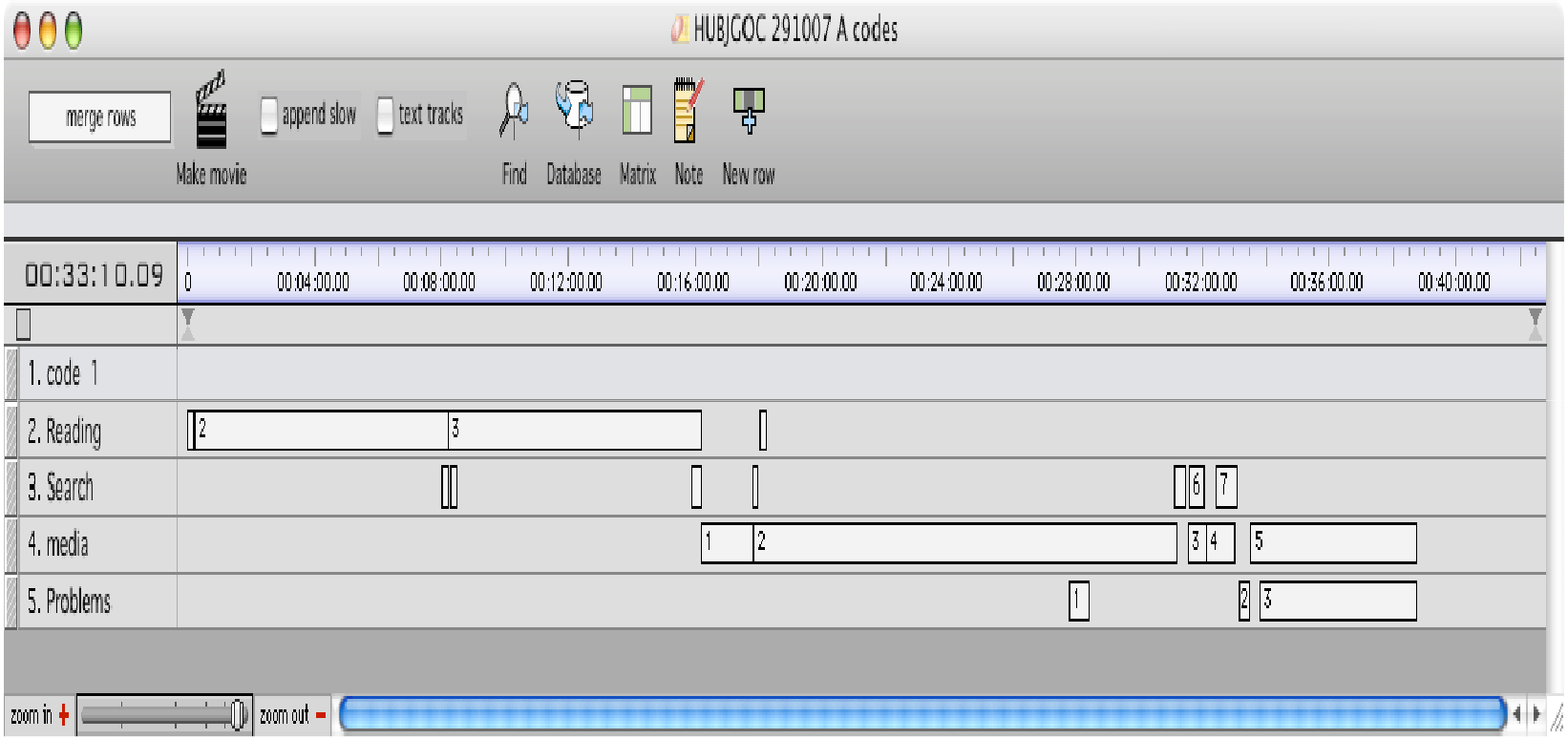
Findings

- Task attributes
- Trends in activity
- Exploration in company
- Applicability & integrity of information
- Stability

Task attributes

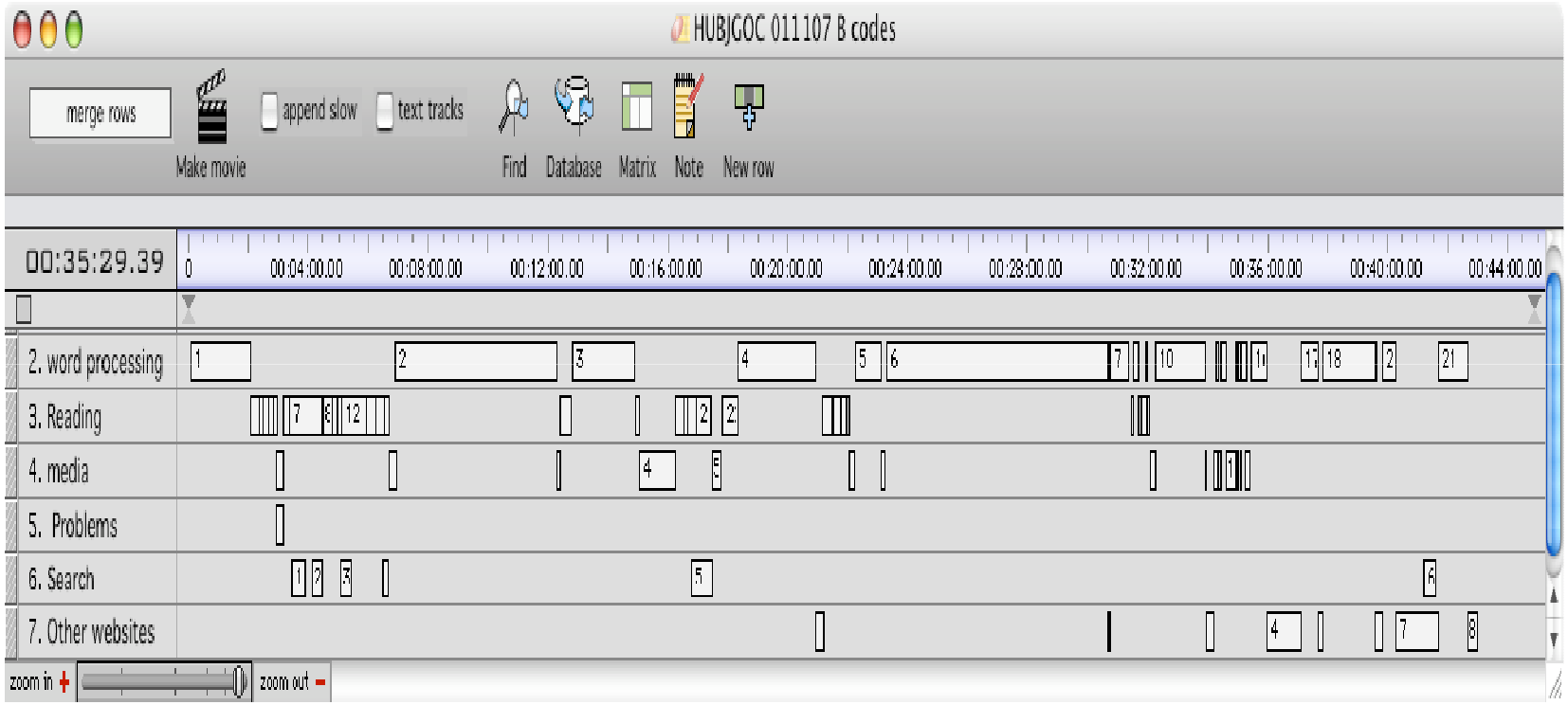
- Started closed and then opened up
- Starting with specific questions increases the degree of familiarisation with the affordances of the SLH

Trends in activity:
Day 1- getting to know the resource

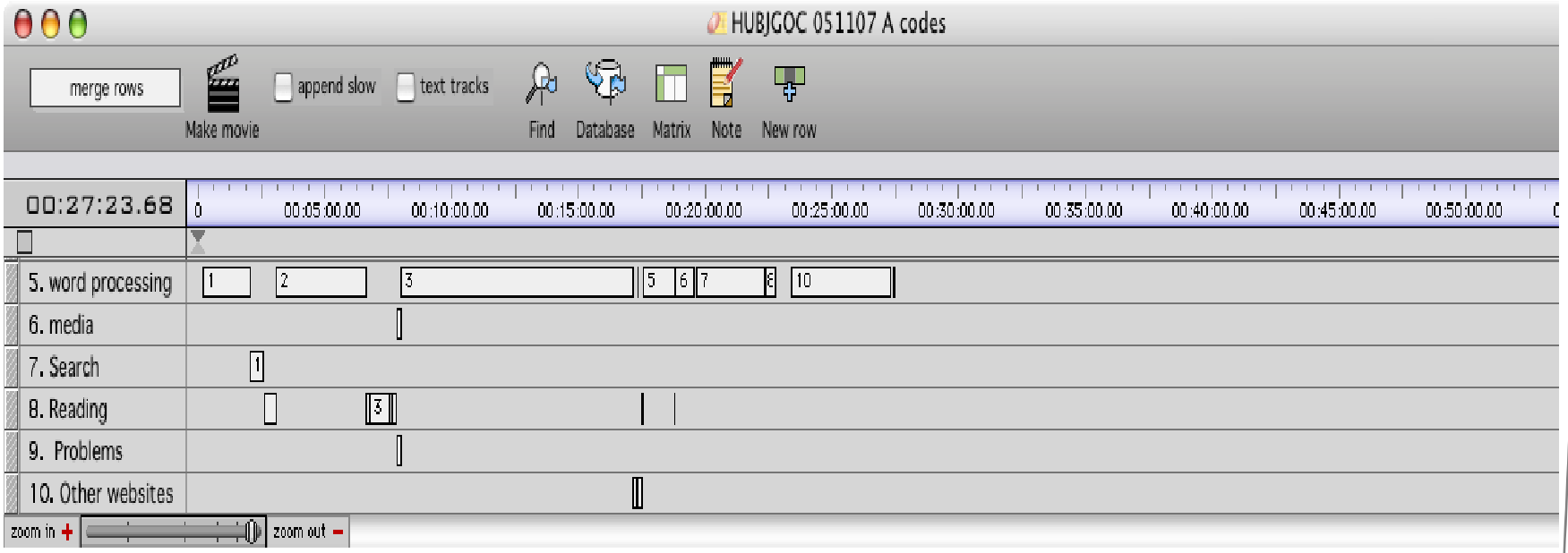


Day 2 - moving to own questions

Day 3 - strategic uses of the resource



Day 4 - finalising & looking for specific material



Exploring in company:
An example of joint engagement

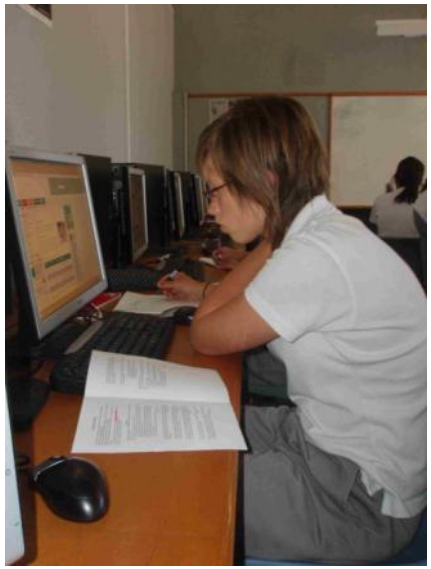
Shared resource

Negotiated meaning

Mutual goal

Exploring in company

- Time on individual tasks is longer when students work alone



- Groups or pairs have to negotiate to agree what is to be done, but share the workload

Exploring in company contd.

- Managing three components
  - content
  - site structure
  - task requirements
- Value of three or more sessions
  - Sparking and enhancing student independency

Applicability & integrity of information

Students technologically competent - but novices at evaluating validity and reliability of content on the internet.

SLH material quality assured by scientists and science educators.

Reliability of search engine

Extract from focus group discussion with teachers:

Mary: Google comes up with lots of information and you only have to put in some words and not lots and lots of stuff. With the Learning Hub website it was easy to find your way around the search engine.

Interviewer: So in what way has this been different?

Mary: Like its more detailed and the search engine is on the website itself not other websites.

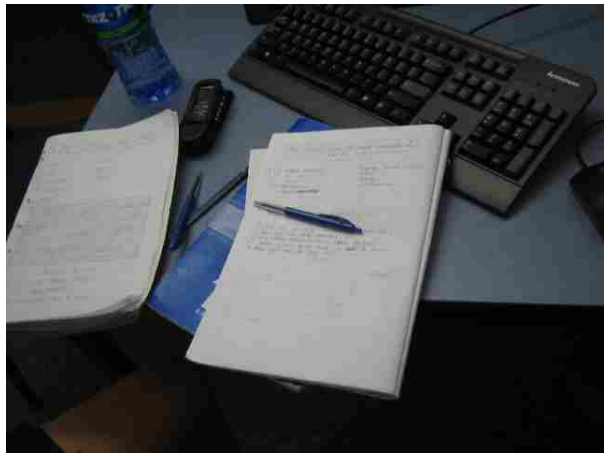
Stability and problems

Technical problems

- Occur frequently
- Students self-manage technical problems
- Teachers take on roles of IT support, facilitator and guide
- Differences between teacher and students computer set up

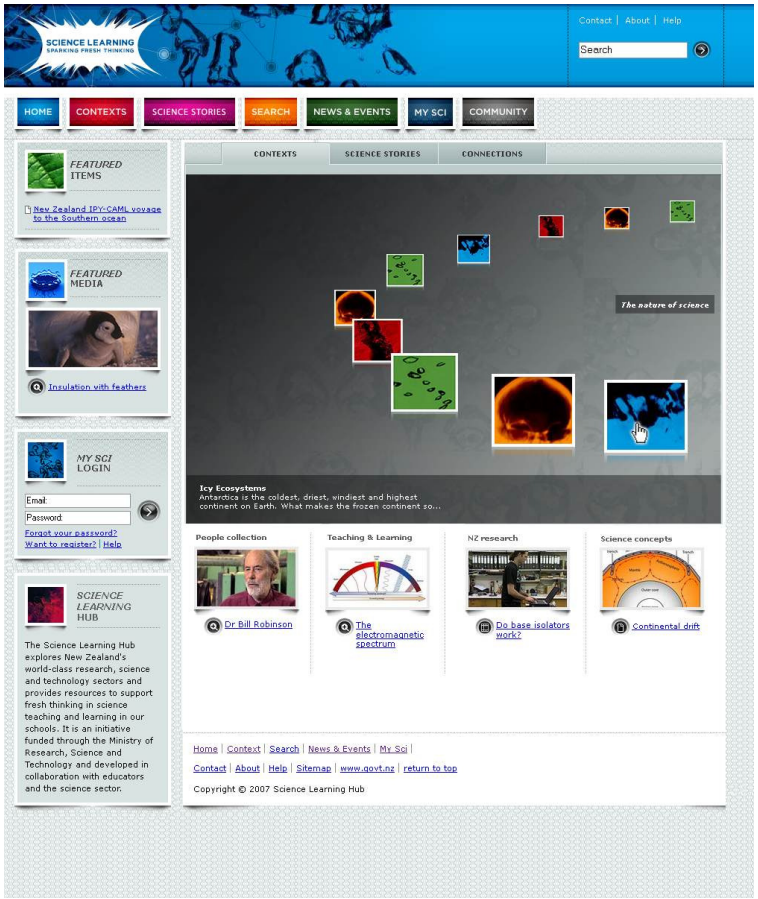
Affordances for the students

- Autonomy to investigate website within a set task (task promotes active participation)
- Freedom and ability to cross-check (navigational tools, IT expertise)
- Group work (talk)
- Trusted site



In summary:
How *do* teachers and students use the SLH

- Setting of tasks balanced freedom and focus
- Contextual examples supported authenticity
- Time was needed to explore, familiarise and interpret material
- Group work: changing leadership roles
- One computer between two or three students: a shared resource



This pilot project provided

- an active and systematic research focus on *how* teachers and students us the Science Learning Hub website,

and informed

- future focus on research and development of the website and ICT use in science classrooms.